INVENTORY OF POTENTIAL BLACK-FOOTED FERRET HABITAT IN MOFFAT AND RIO BLANCO COUNTIES, COLORADO

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INTRODUCTION

The black-footed ferret (Mustela nigripes) is on both the Federal and State endangered species lists. The Endangered Species Act of 1973 states that the ecosystems upon which an endangered species dependsmust be conserved through habitat acquisition and maintenance (U.S. Department of the Interior, 1974). The results of inventories for the presence of endangered species on public land should be reflected in management decisions. The purpose of this project was to survey the national resource lands administered by the Bureau of Land Management in the White River Resource Area for ferret sign, and to identify black-footed ferret habitat. I gratefully acknowledge R.V. Ward for his guidance and interest throughout the study. Lou Vidakovich also provided timely assistance.

Ferrets are most often found in association with prairie dogs, which seem to be a preferred food source (Henderson, Springer, and Adrian, 1974). Under section 1.2000 of the Black-Footed Ferret Recovery Team Plan Proposal, all prairie dog towns are assumed to be black-footed ferret habitat (Linder, unpublished data). There are three species of prairie dogs in Colorado. The white-tailed prairie dog (Cynomys leucurus) is found in eight northwestern counties. From March 1976 to July 1976 research efforts were concentrated in the white-tailed prairie dog towns in Moffat and Rio Blanco Counties.

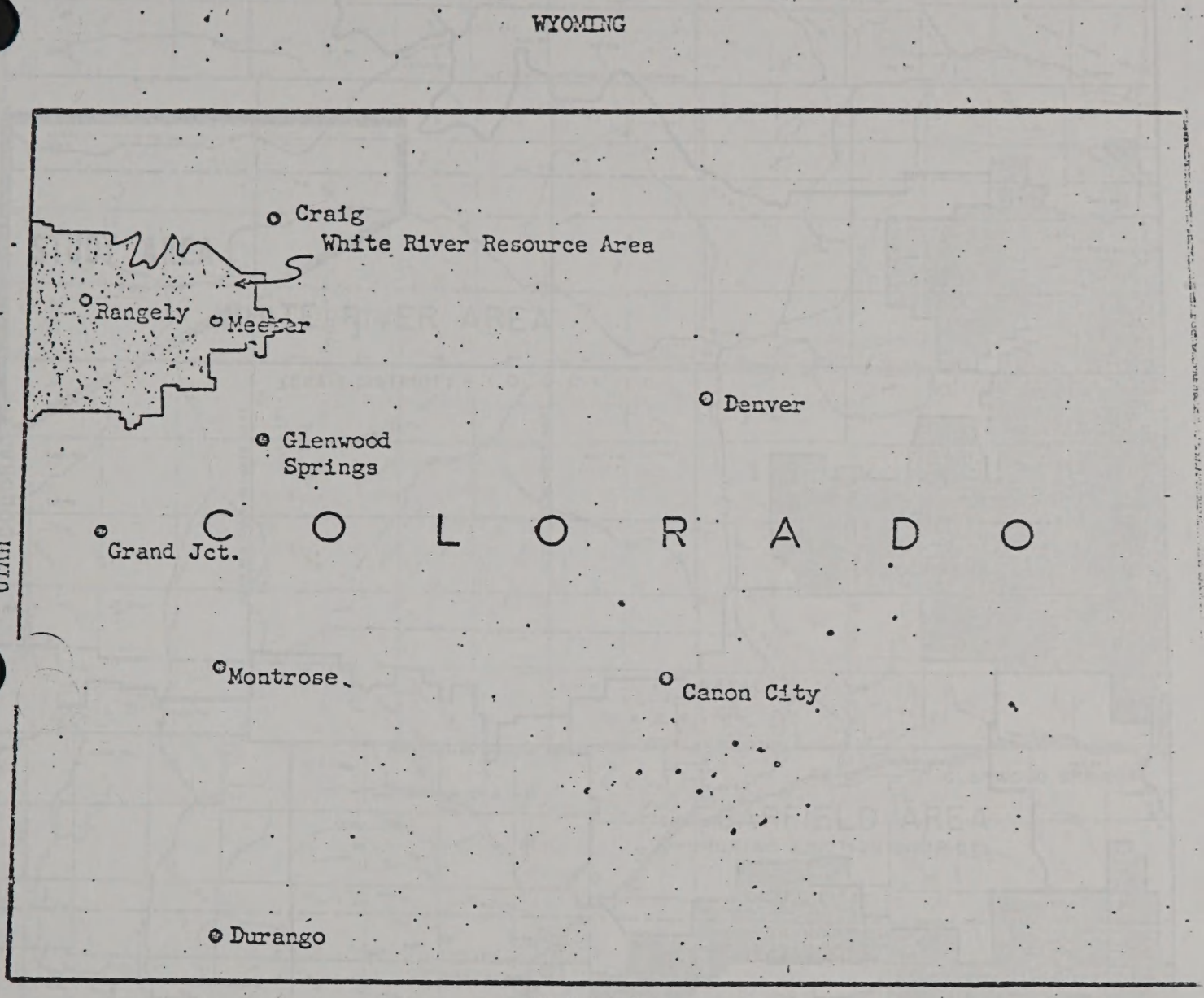
It is not surprising that the historical range of the black-footed ferret coincides with that of the prairie dog. Cahalane, quoted in Torres (1973), listed four acceptable reports of ferrets in Colorado between 1946 and 1953. The last listing of a ferret in northwestern

Colorado was from near Meeker, Rio Blanco County, by Warren in 1942, (Lechleitner, 1962). Since then, there have been several reported sightings in the area but no firm evidence has been found, (R.N. Denney, personal communication).

STUDY AREA

The White River Resource Area is located in northwestern Colorado, (Fig. 1). The west central part of the resource area east from the Utah border, approximately 97,000 ha. (240,000 acres) was surveyed for white-tailed prairie dog towns (Fig. 2). Due to time limitations, the eastern boundary of the study area was set at the 99 West Range line. Most of the study area is in a large semi-arid basin bordered by the White River on the south and U.S. Highway 40 on the north.

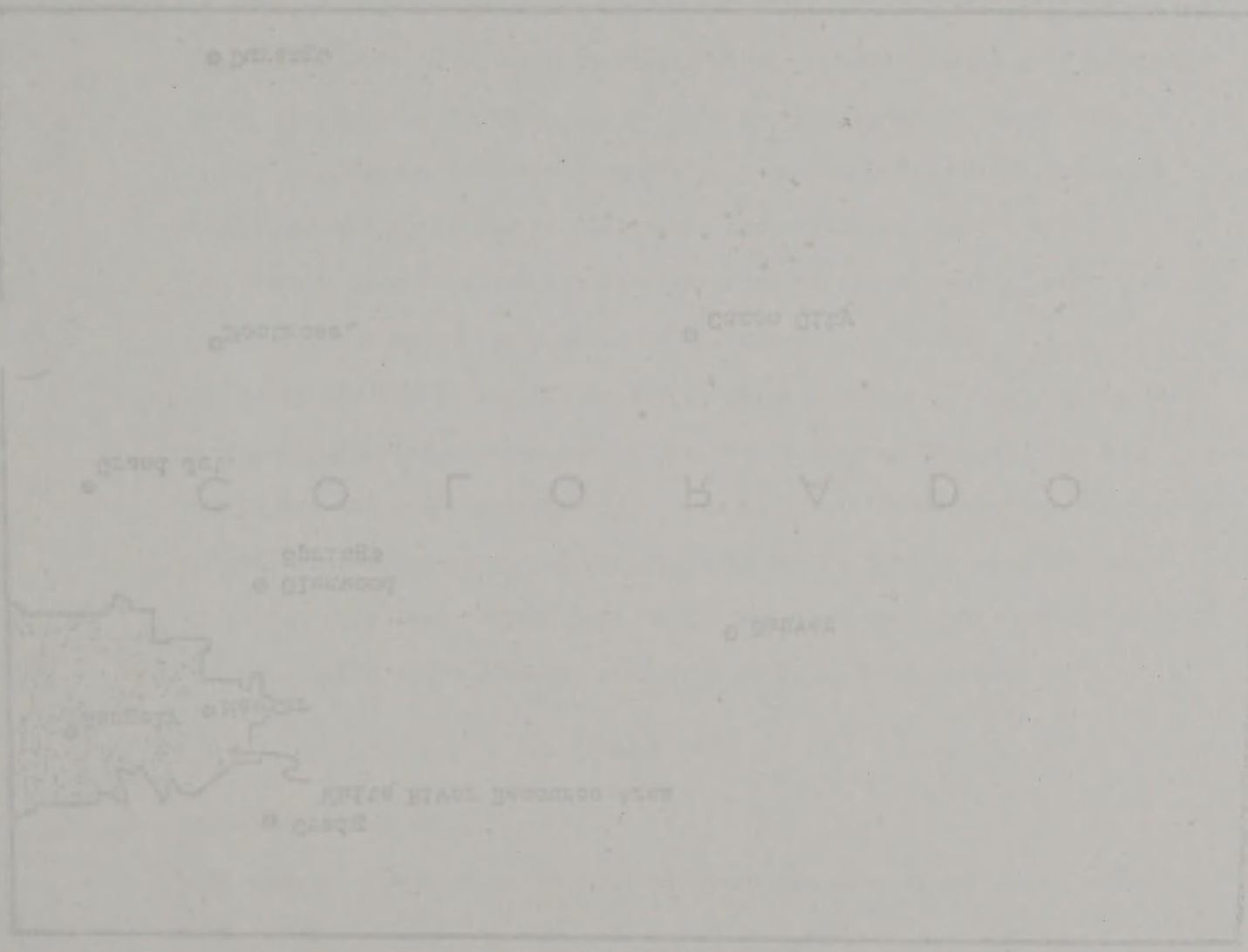
Annual precipitation measures about 27 cm (10.5 inches), occurring primarily as rain during severe summer thunderstorms. Temperature ranges are extreme. Common readings in July and August are in excess of 38 C. (100 F.), dropping to -30 C. (-22 F.) and lower in January and February. Most prairie dog towns are found in open terrain at elevations of between 1585 M. (5200 ft.) and 1829 M. (6000 ft.) (Fig. 3). The major vegetative cover types at these elevations are greasewood (Sarcobatus vermiculatus), saltbush (Atriplex spp.), and sagebrush (Artemisia spp.).



LOCATION MAP

WHITE RIVER RESOURCE AREA

FIGURE NO. 1



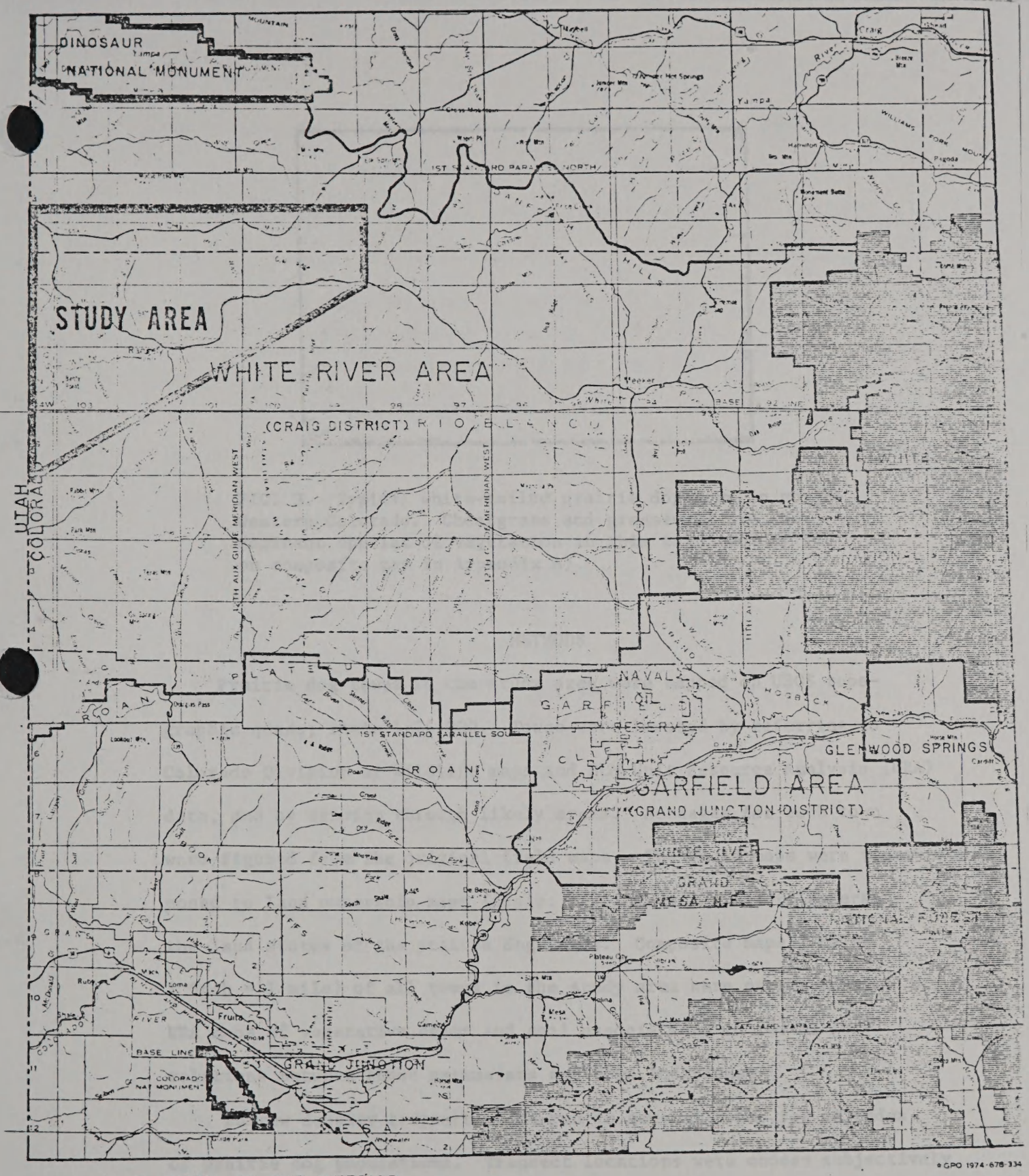


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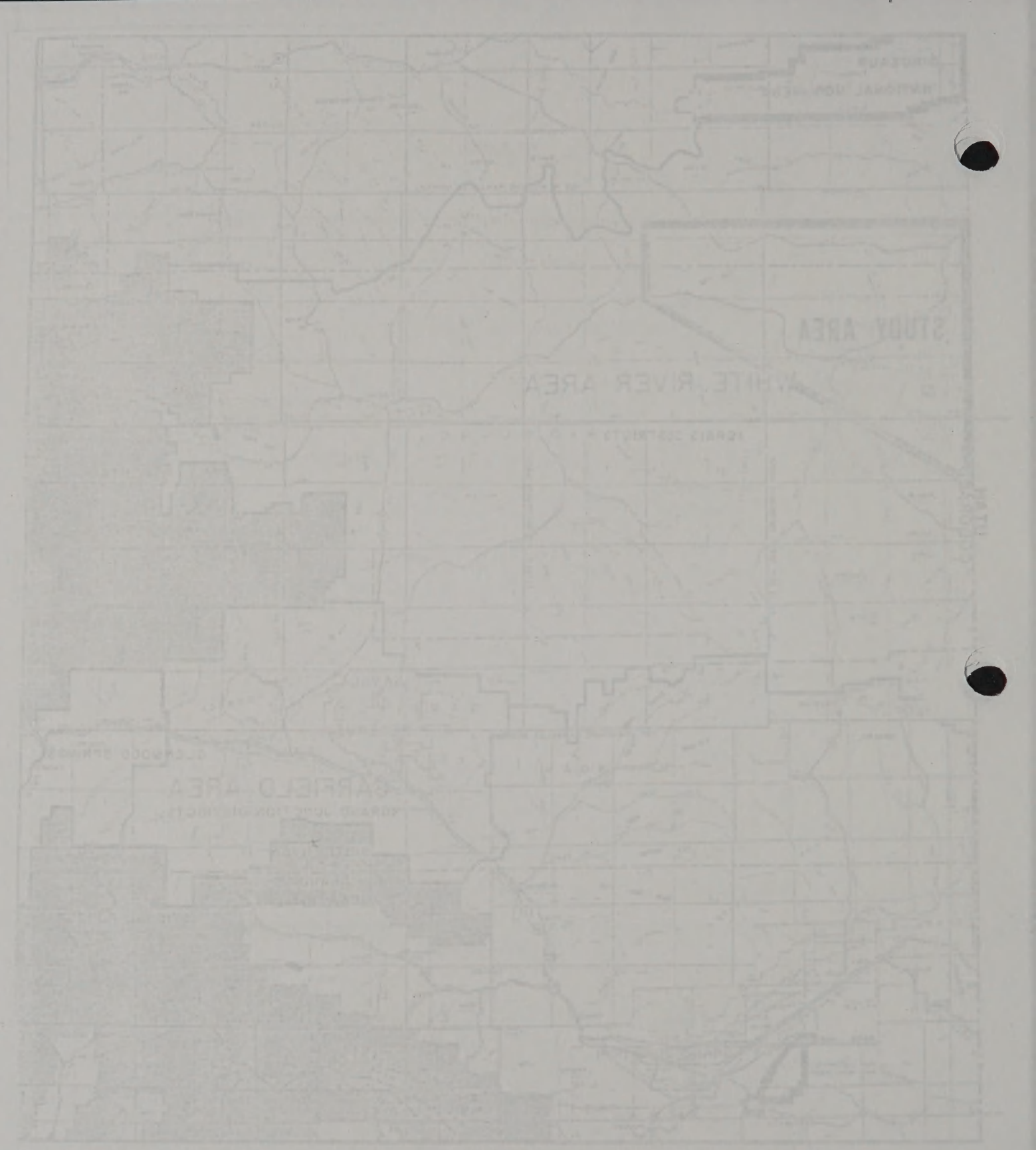
FIG. 2. Study area location.



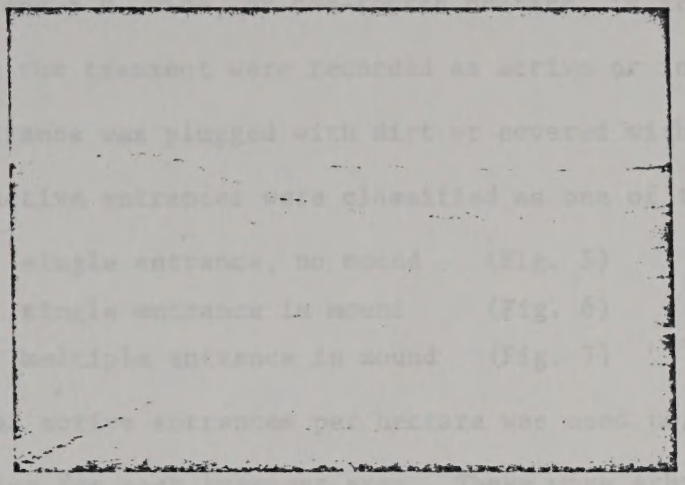
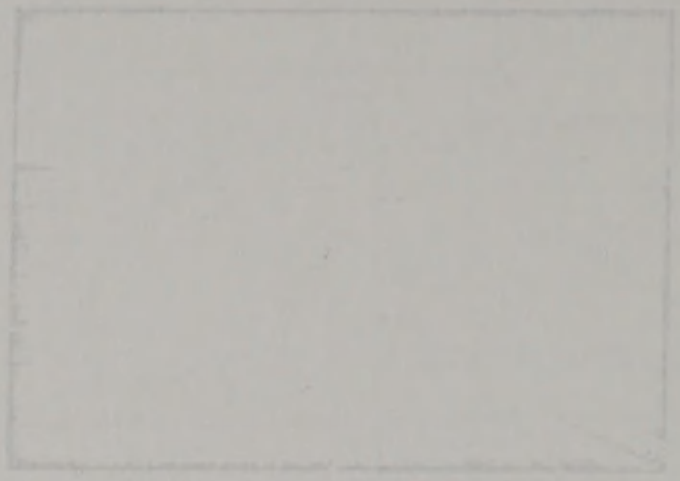


FIG. 3. Typical white-tailed prairie dog town in northwestern Colorado. Cheatgrass and greasewood are the dominant species of vegetation in this town (colony #78 on composite map in Appendix A).

METHODS

Prairie dog towns in the study area were mapped on USGS topographic quads; scale 1:24,000. Towns were located by referring to Colorado Division of Wildlife maps and BLM Unit Resource Analysis (URA) data, and by driving through likely areas. Acreages for each town were figured from the original field maps. The field maps were transposed to land ownership maps (scale: 1/2 inch = 1 mile) to determine the land status of the prairie dog towns. Composite maps (scale: 1 inch = 1 mile) of all towns in the study area were overlayed with URA maps of vegetative cover and soil associations to reveal correlations between these parameters and town locations.

Burrow density transects were run in several towns for an index of prairie dog populations. Transect locations were chosen subjectively in areas felt to be representative of the towns. Each transect was



500 M. long and 5 M. wide, or one-fourth hectare, in area. All burrow entrances in the transect were recorded as active or inactive. An inactive entrance was plugged with dirt or covered with cobwebs, (Fig. 4). Active entrances were classified as one of three types:

single entrance, no mound (Fig. 5)
single entrance in mound (Fig. 6)
multiple entrance in mound (Fig. 7)

The number of active entrances per hectare was used to generate a density rating for each transect area. These were arbitrarily classified as follows:

Low = 1-40 active burrows/ha
Moderate = 41-75 active burrows/ha
High = 75+ active burrows/ha

All transect data was collected from 17 May 1976 - 18 June 1976. Transects were not run after 18 June because of bubonic plague outbreaks in prairie dog towns throughout the State.

The areas sampled by a burrow density transect were also checked for trenches and plugged burrows, which often indicate the presence of a ferret. The first two weeks of March were spent surveying snow-covered prairie dog towns for ferret tracks.

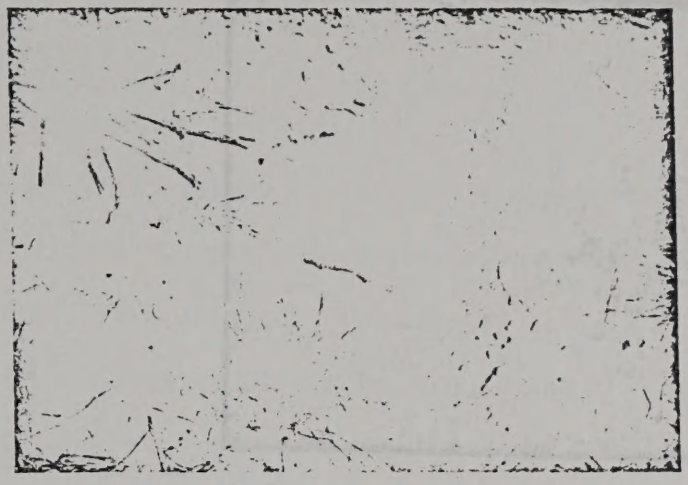


FIG. 4. Abandoned burrow entrance with cobwebs in opening.

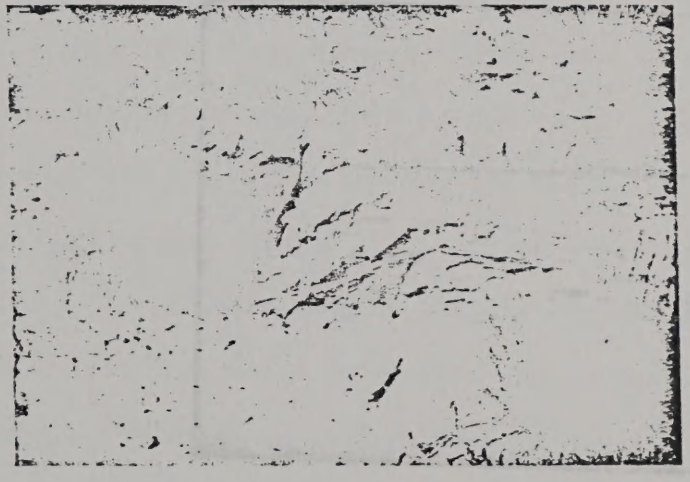
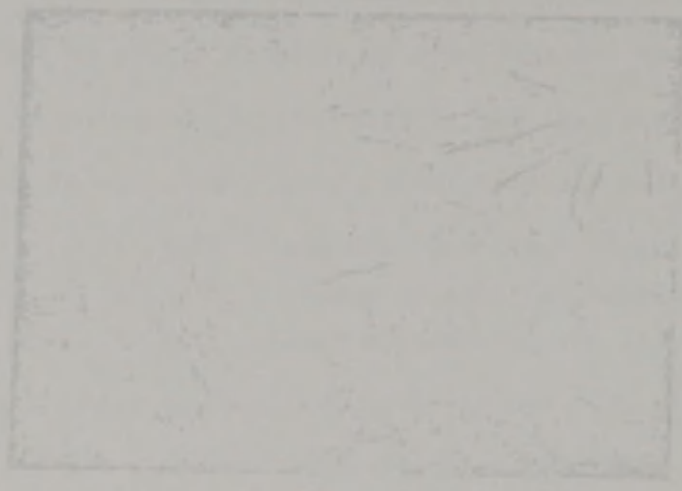


FIG. 5 Single burrow entrance without a mound.



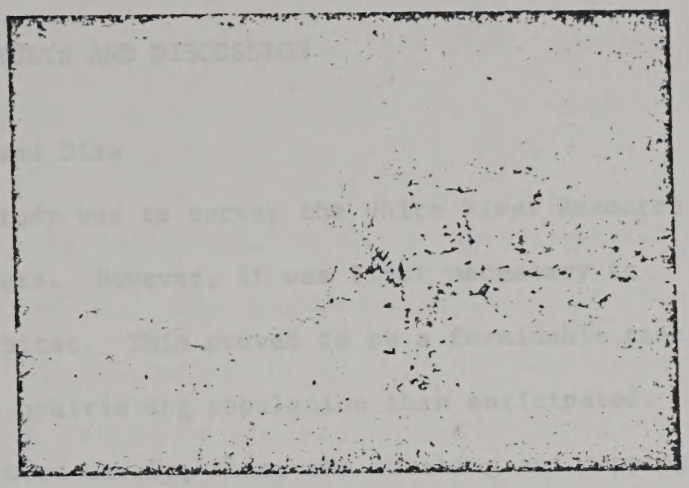


FIG. 6. Single burrow entrance with a mound.

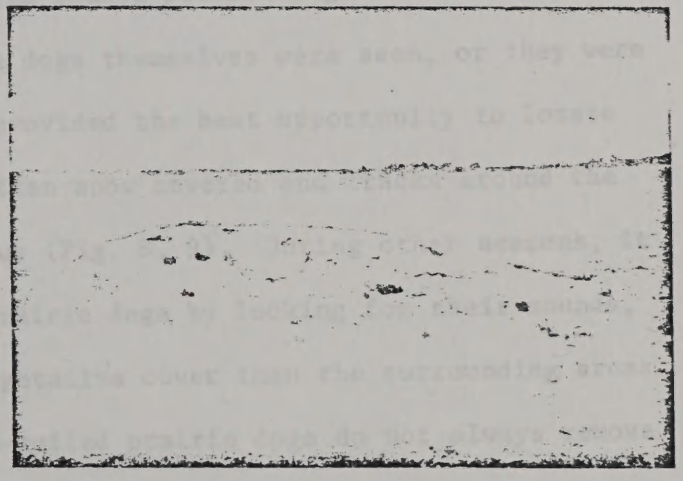
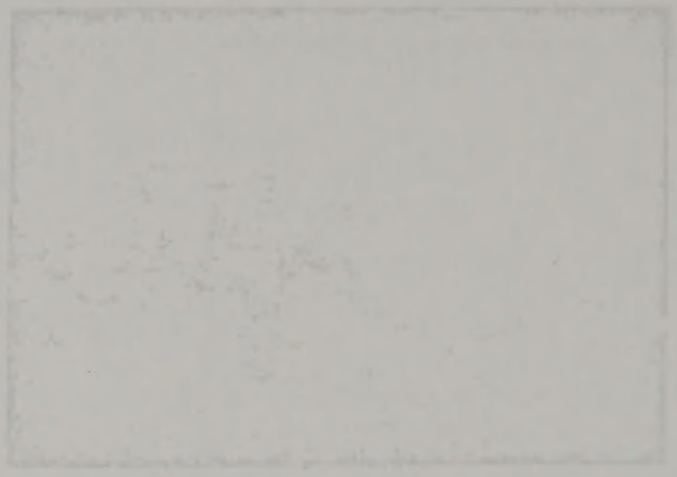


FIG. 7. Mound with multiple burrow entrances.



RESULTS AND DISCUSSION

Prairie Dog Town Location and Size

One purpose of this study was to survey the White River Resource Area for black-footed ferrets. However, it was first necessary to locate potential ferret habitat. This proved to be a formidable task, as there was a much larger prairie dog population than anticipated. The results of this study were mostly, then, the locating and mapping of prairie dog towns. While not totally fulfilling the original purpose, this should provide the necessary groundwork for a future ferret study.

There were three ways to locate prairie dogs from the ground: their mounds were seen, the dogs themselves were seen, or they were heard. The winter months provided the best opportunity to locate towns, as the ground was often snow covered and tracks around the mounds made them conspicuous (Fig. 8, 9). During other seasons, it was also easiest to find prairie dogs by looking for their mounds, which tend to have less vegetative cover than the surrounding areas (Fig. 10). However, white-tailed prairie dogs do not always remove vegetation from their mounds.

Seeing the animals often helped to pinpoint colony locations. Prairie dogs are diurnal and were seen above ground during all months of this study. However, above ground activity was definitely much less in the winter and depended on weather conditions. Patterns of winter activity were easily traced by following trails left in the snow (Fig. 11). In the summer it was easiest to locate dogs before

midmorning while the temperature was still cool. They spent this time feeding and often could be seen sitting upright near their burrows (Fig. 12).

The alarm call of the white-tailed prairie dog is characteristic of the species (Lechleitner, 1969). This was sometimes the first clue to a colony location. The call sounds something like that of a magpie. When searching for a dog town from the road, it was best to drive with the windows down to listen for the animals.

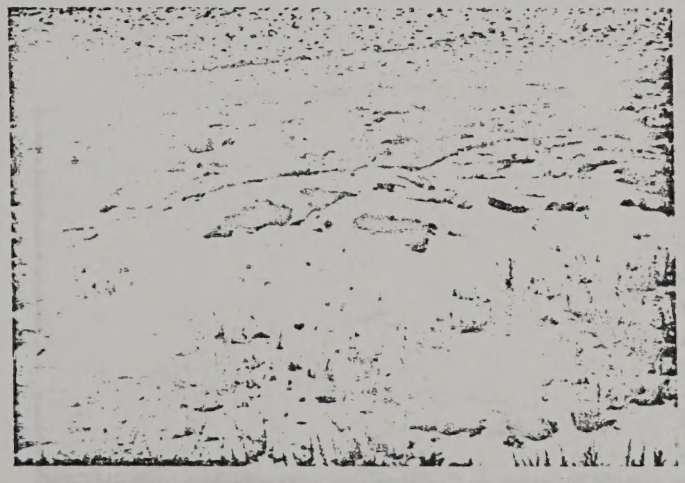
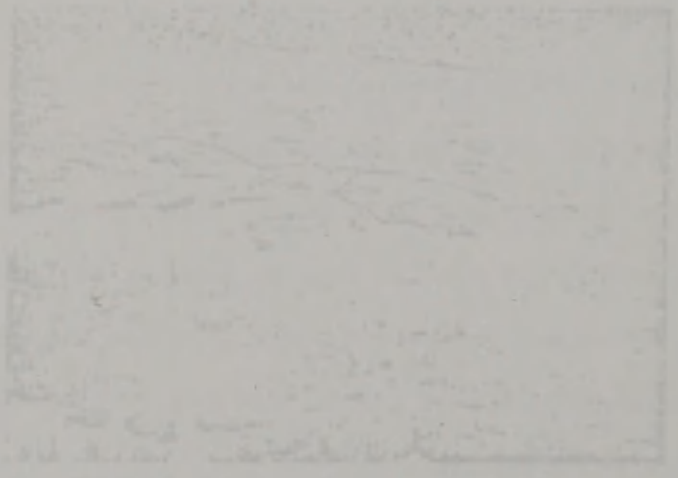


FIG. 8. Prairie dog tracks leading to mound. Cottontail rabbit tracks are visible to the left of center.



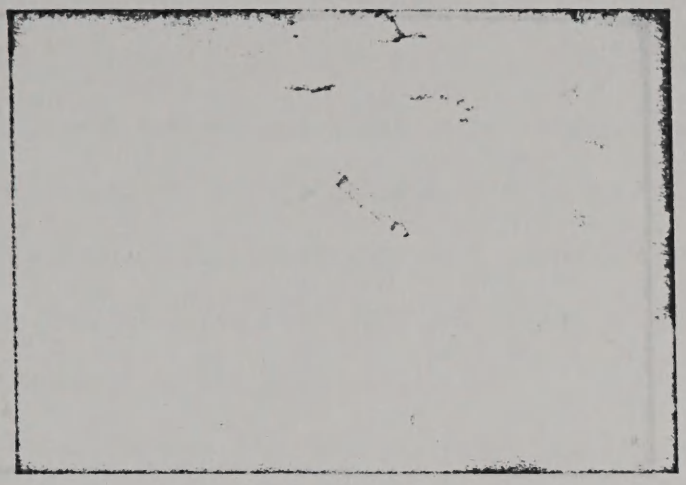


FIG. 9. Close-up of white-tailed prairie dog tracks.

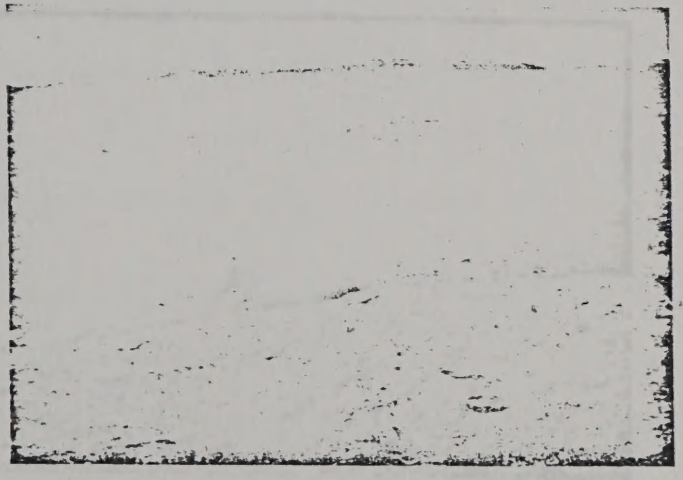


FIG. 10. Prairie dog mounds clearly visible in Town #6.

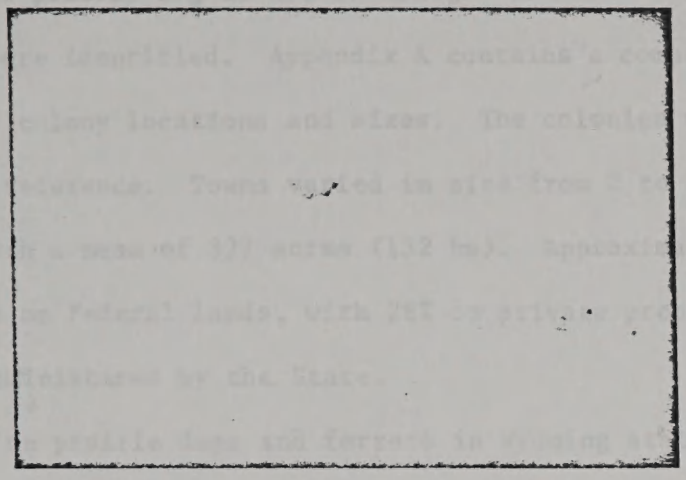


FIG. 11. Winter signs of prairie dog activity.

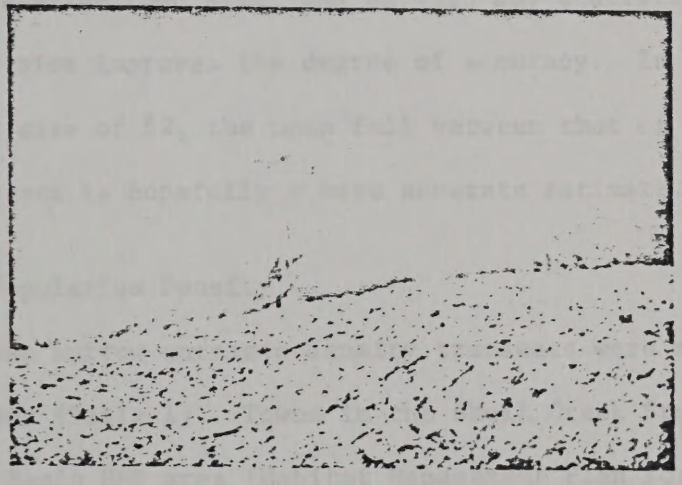
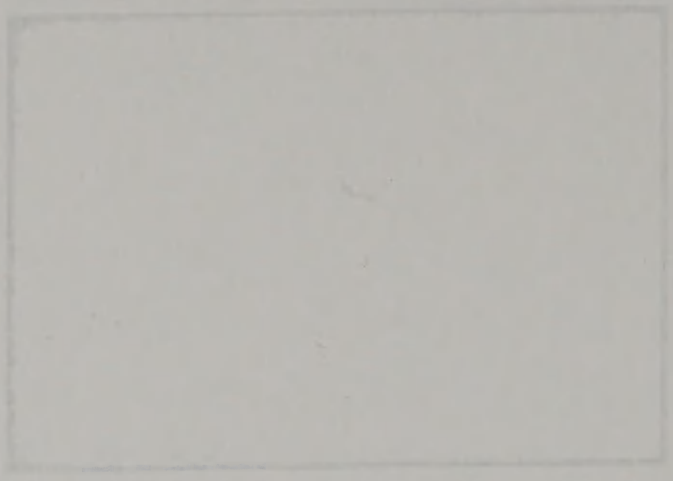
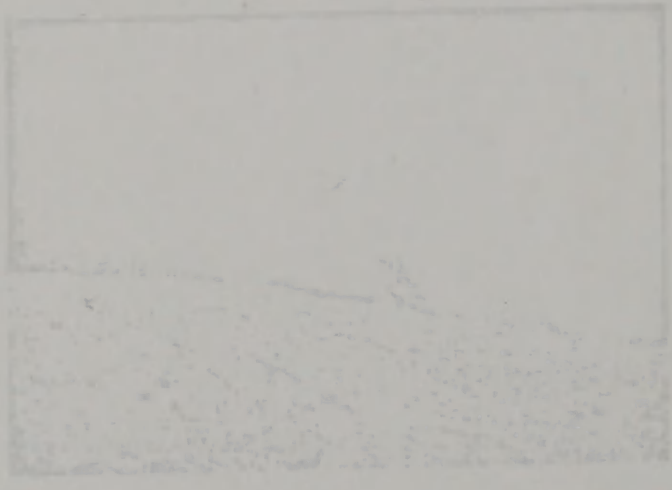


FIG. 12. White-tailed prairie dog "sentry".





Eighty-two prairie dog towns, covering a total of 26,783 acres (10,843 ha), were identified. Appendix A contains a composite map and a breakdown of colony locations and sizes. The colonies were numbered to facilitate reference. Towns varied in size from 2 to 8,276 acres (1-3351 ha) with a mean of 327 acres (132 ha). Approximately 68% of the towns were on Federal lands, with 28% on private property and 4% on lands administered by the State.

A report on prairie dogs and ferrets in Wyoming states that seventeen known white-tailed prairie dog towns averaged 37 acres in size (Clark, 1973). And, during a black-footed ferret habitat inventory in the BLM Montrose District of Colorado, the four prairie dog colonies surveyed averaged 3,213 acres. Obviously there is much variability in estimates of average town size, and as with any statistical mean, a larger sample size improves the degree of accuracy. In this study, with a sample size of 82, the mean fell between that of the two previous studies and is hopefully a more accurate estimate.

Prairie Dog Population Density

Twenty-one burrow entrance density transects were run in fourteen different towns (Table 1). Towns in the Skull Creek Study Area and the Piceance Basin HMP area (Habitat Management Plan for south of the White River) were given priority. Thus, transect data apply only to these areas. Type One data is lacking for transects 10-13 because they were run before inactive burrows were included as a burrow type. In all but one transect, the number of active entrances exceeded the inactive entrances, suggesting that the overall prairie dog population is stable or increasing.

Table 1. Burrow entrance density in white-tailed prairie dog towns

Town #	Transect #	Location	Burrow Entrance Type* 1	2	3	4	Total (Types 2,3,4)	Density Rating
11	1	T.3N., R103W., S.9, NE¼SW¼	4	14	8	2	24	High
15	2	T.3N., R103W.,S.11, NW¼SW¼	2	11	3	6	20	High
16	3	T.3N., R103W.,S.12, SW¼SW¼	0	18	9	12	39	High
19	4	T.3N., R103W.,S.7, SE¼SE¼	0	9	5	17	31	High
32	5	T.3N., R102W., S.3, SE¼NE¼	0	9	5	18	32	High
34	6	T.3N., R101w., S.6, SW¼SW¼	1	8	5	3	16	Mod.
54	7	T.3N., R101W., S.4, SE¼SE¼	2	7	6	9	22	High
55	8	T.3N., R101W., S.3, NE¼NE¼	4	1	2	0	3	Low
57	9	T.4N., R101W.,S.35, NE¼SE¼	2	4	3	2	9	Low
75	10	T.1N., R103W.,S.15, W½NE¼	-	4	3	0	7	Low
75	11	T.1N., R103W.,S.15, N½SE¼	-	0	21	0	21	High
76	12	T.1N., R103W.,S.15, SE¼NW¼	-	3	8	5	16	Mod.
76	13	T.1N., R103W.,S.15, NE¼SW¼	-	1	6	0	7	Low
77	14	T.1N., R103W.,S.22, SE¼NW¼	0	4	0	0	4	Low
77	15	T.1N., R103W.,S.21, SE¼NW¼	4	6	3	0	9	Low
77	16	T.1N., R103W.,S.28, NE¼NE¼	0	2	4	2	8	Low
77	17	T.1N., R103W.,S.34, NW¼NW¼	0	3	1	0	4	Low
77	18	T.1N., R103W.,S.34, SW¼SW¼	0	3	1	0	4	Low
77	19	T.1S., R103W., S.3, NW¼NW¼	1	13	0	4	17	Mod.
78	20	T.1S., R103W.,S.15, NW¼SE¼	0	16	9	12	37	High
79	21	T.1S., R103W.,S.15, SE¼SE¼	0	16	10	0	26	High

*Burrow Entrance Type Notation:

(1) Inactive
(2) Active, no mound
(3) Active, only entrance/mound
(4) Active, one of several entrances/mound

Burrow entrances without mounds were the most common, accounting for 43% of the total number of entrances. Single entrances with a mound and multiple entrances in mounds accounted for 31% and 26% respectively. The most common entrance type varied considerably between transects.

Forty-three percent of the transects received a density rating of high and an equal number a rating of low. Colonies in the same geographic region seemed to have similar densities. For example, six out of the first seven transects were in high density colonies, all of which are located along U.S. Highway 40 between Dinosaur National Monument and Jones Twist. The majority of the transects (7 out of 10) run in the Shavetail Park Area south of the White River received a low density rating. This is to be expected as colonies in the same region should be subject to similar environmental pressures.

Past campaigns to extirpate the prairie dog in favor on agriculture and livestock grazing has resulted in a substantial reduction of the population in Colorado (Torres, 1973). However, in 1972, Executive Order 11643 limited the use of toxicants on Federal lands for rodent control to those not having secondary hazards (Berryman and Johnson, 1973).

Since the 1972 Presidential Order, only small scale prairie dog control for health purposes has taken place on Federal public lands in Colorado. All control work by the state of Colorado since 1971 has been exclusively on private land. Less than 100 acres (40 ha) of prairie dog towns were treated in the last five years in Moffat and Rio Blanco Counties. The poison used under State supervision was Compound 1080 (G. Terrell, personal communication).

Although relatively few prairie dog colonies are being poisoned on lands administered by the Federal and State governments, many on private property are still the target of eradication programs. Two poisons, 1080 and strychnine oat bait, are registered for use by Colorado landowners. These provide the most economical and effective means of prairie dog control in Colorado (Boddicker, 1975).

Soil Associations

Prairie dogs are fossorial rodents and soil associations influence colony locations. Colonies in the study area were found in seven different soil associations:

#59; Camborthids-Torriorthants-Haplargids
#82; Fluvents
#92; Chipeta-Persayo-Badland
#93; Haplargids-Camborthids
#96; Haplargids-Torriorthents-Rock Outcrop
#99; Torriorthents-Rock Outcrop
#133; Ustorthents

Most of these are warm, deep to shallow desert-like soils. Appendix B contains a description of each soil association as well as maps of their distribution in reference to prairie dog town locations.

Seventy-three percent of the dog colonies were in the Haplargids-Camborthids Association, (Table 2). This association consists primarily of shallow to moderately deep, well drained, calcareous and often gypsiferous, gravelly to stony medium textured soils and medium textured wind deposited soils. The Camborthids-Torriorthents-Haplargids Association was characteristic of 12% of the prairie dog towns. These soils are very shallow to deep, calcareous, and gravelly to stony

moderately coarse to moderately fine textured. The prairie dogs apparently preferred soils that were not fine textured. Drainage factors would logically be another criteria for suitable prairie dog habitat. The remaining 13% of the prairie dog colonies were located in areas of the other five soil associations.

Table 2. Soil Association composition of prairie dog colonies in Moffat and Rio Blanco Counties, Colorado

	Soil Association						
	59	82	92	93	96	99	103
# acres	3,152	565	963	19,523	1,245	1,059	276
# hectares	1,276	229	390	7,904	504	429	112
% of total	12	2	3	73	5	4	1

Vegetative Cover

Vegetative cover is a major component of any ecosystem. The prairie dog colonies in the study area were located in four major vegetative cover types: Type 4 - sagebrush, Type 9 - pinyon-juniper, Type 13 - saltbush, and Type 14 - greasewood. Colonies were also located in areas dominated by annuals and a poisonous plant, Halogeton glomeratus. A breakdown by acreage and maps of the vegetative cover in each colony is contained in Appendix C, as well as a description of the four major vegetative cover types.

Sixty-one percent of the prairie dog towns were in areas where saltbush is the dominant vegetative cover (Table 3). Shadscale (Atriplex confertifolia) is the most common saltbush in these regions. Slightly

less than one-third of the towns are in areas dominated by sagebrush, primarily big sagebrush (Artemisia tridentata). The remaining colonies are in regions of greasewood, pinyon-juniper, Halogeton, or annuals.

Table 3. Vegetative cover composition of prairie dog towns in Rio Blanco and Moffat Counties, Colorado

	Vegetative Cover Type					
	saltbush	sagebrush	greasewood	pinyon-juniper	Halogeton	Annuals
# Acres	16,380	8,058	1,471	480	247	147
# hectares	6,632	3,262	596	194	100	60
% of total	61	30	5	2	1	1

The preferred food species of the white-tailed prairie dog predicted on the basis of colony location would be saltbush. Sagebrush, the dominant vegetative cover in 30% of the colonies would also be a common food. This agrees with the results of Martin, Zim and Nelson's 1961 study on white-tailed prairie dog food habits.

In that study, stomachs of prairie dogs from Wyoming and Montana were examined in each season. One hundred percent of the diet in winter and spring was composed of plant materials, as was 98% and 99% of the summer and fall diets respectively. During the summer and early fall, the animals took a few beetles, insect larvae, and grasshoppers. The plant species most common in the diet was saltbush (Fig. 13). Sagebrush was also found to be a common food in all seasons excepting summer (Table 4).

Table 4. Composition of the diet of the white-tailed prairie dog.*

Plant Species	% of Diet	Season of Use
Saltbush (leaves)	25-50	Sp, Su, F, W
Russianthistle (leaves)	10-25	Sp, Su, F, W
Wheatgrass	5-10	Sp, Su, F, W
Sagebrush (leaves & flowers)	5-10	Sp, F, W
Onion (bulb)	5-10	Su, F
Bluegrass	2-5	Sp, Su, F, W
Pricklypear (fruit & seed)	Trace	F, W
Wheat	Trace	F
Tansymustard, Hawksbeard Blue wildlettuce, Fescuegrass, Bromegrass	Trace	Su, F

*Adapted from Martin (1961).

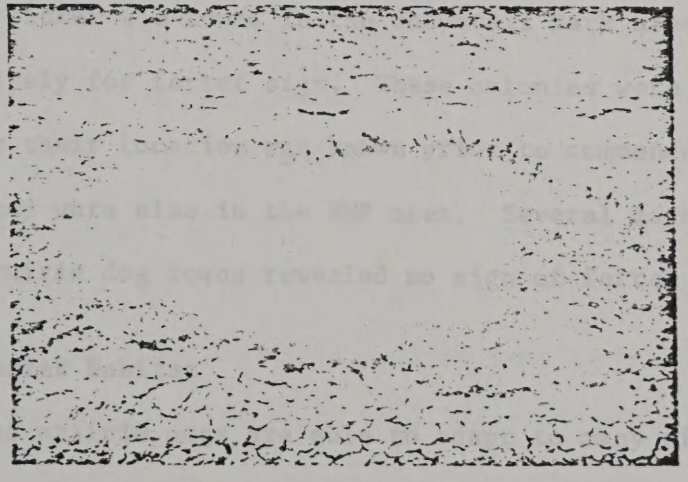
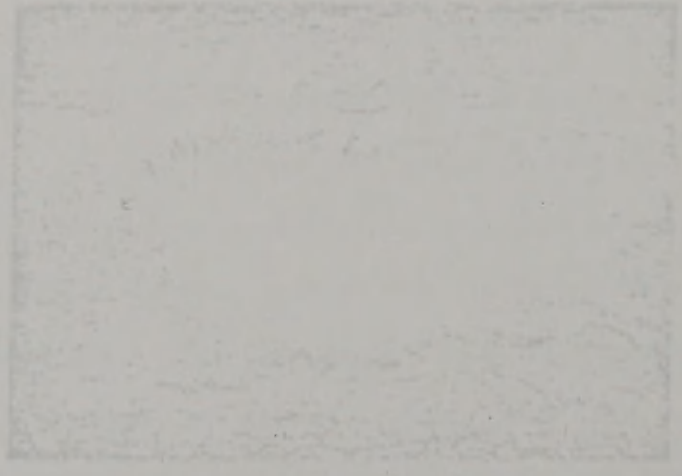


Fig. 13. Saltbush, a common prairie dog food.



Ferret Survey

No black footed ferrets were seen during the study period, but all field work was conducted during the daytime. Ferrets are primarily nocturnal so the chances of seeing one are greatly improved at night. No spotlighting was done however, because winter checks with snow ground cover were suggested as a more practical method of ferret survey than night observations with spotlights (R.N. Denney, unpublished data). Winter is one of the best times for observing signs of ferret activity since ferret tracks and digging are most evident in fresh snow. Also, prairie dogs are less active in winter and not as likely to erase signs of ferret digging (Henderson, 1974).

The majority of winter days were spent just trying to locate prairie dog towns, as this project did not start until mid-February. However, during winter the towns in the Shavetail Park area were surveyed intensively for ferret sign. These colonies were given priority because their location was known prior to commencement of the study and they were also in the HMP area. Several days of walking through these prairie dog towns revealed no sign of ferret activity.

Management of Ferret Habitat

White-tailed prairie dogs are able to adapt to many of the changes man imposes on their environment. Houses, powerlines, telephone lines, pipe lines, highways, roads, fences, and stockponds are in or near several of the colonies. For example, town 11 includes the yard of the Dinosaur National Monument Visitor Center. Town 9 is next to a group of tourist cottages. The boundary of colony 73

ends at the parking lot of Northwestern Colorado Community College in Rangely. Colony 81 is next to the Rangely airport. Town 30 is crisscrossed by roads and dotted by oil wells. A major powerline runs parallel to U.S. Highway 40, through towns 15, 20, 46, 42, 32, 56, 58, and 59. An underground pipeline runs through towns 50, 76, and 75. Many towns in the study area are located adjacent to U.S. Highway 40. And, dogs are often found in areas where livestock concentrate, such as around the stockponds in colonies 77 and 59. Because prairie dogs are not particularly sensitive to man's activities, multiple use of national resource lands poses no great threat to their population. However, land use practices may have to be adjusted to comply with the Endangered Species Act if a black-footed ferret is discovered.

The majority of the colonies are in grazing allotments utilized by sheep in the winter and spring. Sheep and prairie dogs seem to coexist in harmony. It is not uncommon to see them feeding side by side. In the absence of any grazing pressure, prairie dog numbers decline (Berryman, 1973). The dogs prefer somewhat open terrain without tall vegetation so they can see the surrounding areas, as one of their defenses against predators is visual detection. If prairie dog competition is reducing livestock production by an appreciable amount, control measures may be necessary. When this is the case, control must be in compliance with Executive Order 11643, and control of population numbers does not imply eradication of the colony.

Sport hunting of prairie dogs on national resource lands is an acceptable practice. It is virtually impossible to control prairie dogs by shooting (Boddicker, 1975) because hunting mortality probably compensates for density dependent factors such as disease and intraspecific competition. Also, since ferrets are nocturnal, there is slight chance of one becoming a target. To some people, the recreational benefit of prairie dog hunting is the only justification for allowing the colonies to exist. In the interest of preserving ferret habitat, it is best to have as much favorable public opinion as possible toward the prairie dog.

As far as management of prairie dogs on national resource lands in the White River Resource Area is concerned, no major changes are necessary. All prairie dog colonies should be recognized as potential ferret habitat and a thorough survey for ferret sign should be conducted before any alterations in land use practices are implemented in areas inhabited by prairie dogs. And, if a ferret is ever found, the area it inhabits must be protected in accordance with the Endangered Species Act of 1973.

CONCLUSION

Perhaps the most important result of this study was that it revealed the extent of the white-tailed prairie dog population in Rio Blanco and Moffat Counties. It was by no means a survey of the area for the black-footed ferret. If this is to be accomplished, it must be the objective of additional research. Suggested research goals are to: (1) Survey the towns in the study area for ferret sign in the winter, (2) Inventory the rest of the Resource Area for prairie dogs, (3) Run burrow entrance density transects in all towns, and (4) Continue studies of factors affecting prairie dog colony location.

Included in goal number one is the understanding that if winter daytime checks reveal any possibility of ferret activity, nighttime surveys should be made in that area. Goal number two is important because all inventory work was done from a vehicle so only those areas with access were surveyed. There are undoubtedly many more colonies in remote areas. The northeast section of the Resource Area was not even inventoried and there are many reports from BLM field personnel of large prairie dog populations in that region.

Burrow density transects should be run in each town for a more representative sample of the total prairie dog population and to indicate the population trends in the area. This data would be useful if ferret introductions are considered in Colorado. Prairie dog colonies with high density ratings should be recognized as possible release sites. Density data would also make it possible to

correlate environmental factors such as vegetative cover and soil associations with colony density as well as location.

Goal number four is simply to better understand the environmental requirements of the white-tailed prairie dog. On site soil analysis, instead of referring to maps of general soil associations, would lead to a better understanding of this environmental factor. And, vegetative composition transects run in the prairie dog colonies would generate data on a smaller and more accurate scale than the major vegetative types designated on the URA overlay. Data on plant density and sub-type species could also be collected.

Continuing research efforts on problems such as those just noted, and the results of this study will hopefully help in the understanding and management of black-footed ferret habitat in the White River Resource Area of Colorado.

LITERATURE CITED

Berryman, J.H., and N.C. Johnson. 1973. Ferret and prairie dog programs on public lands: a perspective and some facts. p. 109-118. In R.L. Linder and C.N. Hillman (ed.) Proceedings of the black-footed ferret and prairie dog workshop. South Dakota State Univ., Brookings.

Boddicker, M.L. 1975. Managing prairie dog populations. Colorado State Univ. Bull. 6.506.2

Clark, T.W. 1973. Prairie dogs and black-footed ferrets in Wyoming. p. 88-101. In R.L. Linder and C.N. Hillman (ed). Proceedings of the black-footed ferret and prairie dog workshop. South Dakota State Univ. Brookings.

Henderson, F.R., P.F. Springer, and R. Adrian. 1974. The black-footed ferret in South Dakota. South Dakota Dep. of Game, Fish, and Parks. Pierre. 37p.

Lechleitner, R.R. 1969. Wild mammals of Colorado. Pruett Publishing Co., Boulder. 254 p.

Martin, A.C., H.S. Zim, and A.L. Nelson. 1961. American Wildlife and plants. Dover Pub. In., New York.

Torres, J.R. 1973. The future of the black-footed ferret of Colorado. p. 27-38. In R.L. Linder and C.N. Hillman (ed). Proceedings of the black-footed ferret and prairie dog workshop. South Dakota State Univ., Brookings.

U.S. Department of the Interior. Fish and Wildlife Service. 1974. United States list of endangered fauna. 22 p.

APPENDIX A

Prairie Dog Town Location, Size, and Land Status

LAND STATUS LEGEND

Description	Printing Color	Description	Printing Color
Public Domain (Including National Resource Lands)	Yellow	Patented	Blank
O & C Lands	Lt. Green	State Lands*	Dk. Blue
CBWR Coos Bay Wagon Road	Violet	Reclamation and Water Power Projects Withdrawal	Warm Red
National Forest	Green	Powersite Withdrawal	Warm Red
National Parks and Monuments	Purple	Federal Agency Protective Wdl.	Warm Red
Indian Lands or Reservation	Orange	AEC Withdrawal	Warm Red
Military Reservation and Military Withdrawal	Red	Public Water Reserve	Warm Red
Wildlife Refuge	Blue Green	O & C Lands Adm. by U. S. F. S.	Green
Bankhead - Jones L.U. Lands	Pink	Radio & Air Facilities	Green
		Miscellaneous	Green
		State Wildlife, Parks And Outdoor Recreation Areas	Blue

Town umber	Legal Description	Acres	Hectares
1	T. 3 N., R. 104 W., S. 2, 3, 11, 12, 22, 26, 27, 34, 35	1634	662
2	T. 3 N., R. 103 W., S. 18, 19, 25, 30	517	209
3	T. 3 N., R. 103 W., S. 31, R. 104 W., S. 36	34	14
4.	T. 3 N., R. 103 W., S. 6, 31	26	10
5.	T. 2 N., R. 103 W., S. 6, 7, 8	248	100
6.	T. 2 N., R. 103 W., S. 7, R. 104 W., S. 1, 12	18	7
7.	T. 2 N., R. 104 W., S. 12, 13	64	26
8.	T. 2 N., R. 104 W., S. 13, 14, 22, 23	740	300
9.	T. 3 N., R. 103 W., S. 7, NW¼, SE¼	6	2
10.	T. 3 N., R. 103 W., S. 7, SE¼, SE¼	8	3
11.	T. 3 N., R. 103 W., S. 7, 8, 9, 16, 17, 18	778	315
12.	T. 3 N., R. 103 W., S. 9, NW¼, SE¼	6	2
13.	T. 3 N., R. 103 W., S. 9, NE¼, SE¼	3	1
14.	T. 3 N., R. 103 W., S. 10	2	1
15.	T. 3 N., R. 103 W., S. 10, 11, 13, 14, 15	898	364
16.	T. 3 N., R. 103 W., S. 11, 12	40	16
17.	T. 3 N., R. 103 W., S. 12, NE¼, SE¼	3	1
18.	T. 3 N., R. 103 W., S. 12, SE½, SE¼	24	10
19.	T. 3 N., R. 102 W., S. 5, 7, 8	220	89
20.	T. 3 N., R. 102 W., S. 18	14	6
21.	T. 3 N., R. 103 W., S. 16	94	38
22.	T. 3 N., R. 103 W., S. 21, E½, NW¼	20	8
23.	T. 3 N., R. 103 W., S. 21, NW¼, NE¼	10	4
24.	T. 3 N., R. 103 W., S. 14, 23	66	27

wn nber	Legal Description	Acres	Hectares
25.	T. 3 N., R. 103 W., S. 27	16	6
26.	T. 3 N., R. 103 W., S. 27, 28	50	20
27.	T. 3 N., R. 103 W., S. 29, 30	60	24
28.	T. 3 N., R. 103 W., S. 31, 32, T. 2 N., S. 5, 6	9	4
29.	T. 3 N., R. 103 W., S. 34, T. 2 N., S. 3	184	74
30.	T. 2 N., R. 102 W., S. 6, 7, 8, 17	933	378
31.	T. 2 N., R. 103 W., S. 8	12	5
32.	T. 3 N., R. 102 W., S. 1-5, 8-12, R. 101 W., S. 7, 8, 9, 16, 17	2534	1026
33.	T. 3 N., R. 102 W., S. 1	36	15
34.	T. 3 N., R. 102 W., S. 1, R. 101 W., S. 6	80	32
35.	T. 3 N., R. 101 W., S. 6	2	1
36.	T. 3 N., R. 101 W., S. 6, 7	26	10
37.	T. 3 N., R. 101 W., S. 5, 6	42	17
38.	T. 3 N., R. 101 W., S. 5, 6, 8	57	23
39.	T. 3 N., R. 101 W., S. 5, $S\frac{1}{2}SE\frac{1}{4}$	8	3
40.	T. 3 N., R. 102 W., S. 11, $NE\frac{1}{4}$, $NW\frac{1}{4}$	15	6
41.	T. 3 N., R. 102 W., S. 11, $SW\frac{1}{4}$, $NW\frac{1}{4}$	24	10
42.	T. 3 N., R. 102 W., S. 11, 14	60	24
43.	T. 3 N., R. 102 W., S. 10	18	7
44.	T. 3 N., R. 102 W., S. 8, 9, 10	102	41
45.	T. 3 N., R. 102 W., S. 8, 17	45	18
46.	T. 3 N., R. 102 W., S. 15	12	5
47.	T. 3 N., R. 102 W., S. 14, 15	196	79
48.	T. 3 N., R. 102 W., S. 13, 24, R. 101 W., S. 18	321	130

Town nber	Legal Description	Acres	Hectares
49.	T. 3 N., R. 101 W., S. 17, 20	110	44
50.	T. 3 N., R. 102 W., S. 29, 32, 33, 34, T. 2 N., S. 3, 4, 5	578	234
51.	T. 3 N., R. 101 W., S. 30, 31	16	6
52.	T. 3 N., R. 101 W., S. 5, SE¼, SE¼	2	1
53.	T. 3 N., R. 101 W., S. 5, 8, 9	8	3
54.	T. 3 N., R. 101 W., S. 4, 9	36	15
55.	T. 4 N., R. 101 W., S. 34, T. 3 N., S. 2, 3	230	93
56.	T. 3 N., R. 101 W., S. 2, 3, 9, 10, 11, 14	1155	468
57.	T. 4 N., R. 101 W., S. 35, 36, T. 3 N., S. 1, 2, 11, 12	837	339
58.	T. 3 N., R. 101 W., S. 1, 12, 13, R. 100 W., S. 5, 6, 7, 8, 18	1508	610
59.	T. 3 N., R. 100 W., S. 1, 2, 8-18, 21-24 T. 3 N., R. 99 W., S, 7, 18, 19, 20 T. 4 N., R. 100 W., S. 23, 25, 26, 36	8276	3351
60.	T. 3 N., R. 101 W., S. 13, R. 100 W., S. 16, 17, 18	226	91
61.	T. 3 N., R. 101 W., S. 13	15	6
62.	T. 3 N., R. 101 W., S. 14, 15	9	4
63.	T. 3 N., R. 101 W., S. 22, 23	210	85
64.	T. 3 N., R. 101 W., S. 21	72	29
65.	T. 3 N., R. 101 W., S. 23-27, R. 100 W., S. 19, 30	1008	408
66.	T. 3 N., R. 100 W., S. 29	3	1
67.	T. 3 N., R. 101 W., S. 26, 35	45	18
68.	T. 2 N., R. 100 W., S. 8, 9	38	15
69.	T. 2 N., R. 100 W., S. 10	8	3
70.	T. 2 N., R. 100 W., S. 9, 10	75	30

Town mber	Legal Description	Acres	Hectares
71.	T. 4 N., R. 100 W., S. 13	78	32
72.	T. 4 N., R. 100 W., S. 14, 23	86	35
73.	T. 1 N., R. 102 W., S. 1, 12	60	24
74.	T. 1 N., R. 102 W., S. 11, 12	26	10
75.	T. 1 N., R. 103 W., S. 15, $E\frac{1}{2}$	120	49
76.	T. 1 N., R. 103 W., S. 15, $SE\frac{1}{4}$, $NW\frac{1}{4}$	72	29
77.	T. 1 N., R. 103 W., S. 16, 21, 22, 27, 28, 33, 34 T. 1 S., R. 103 W., S. 3, 4	1108	449
78.	T. 1 S., R. 103 W., S. 15, $NW\frac{1}{4}$, $SE\frac{1}{4}$	36	15
79.	T. 1 S., R. 103 W., S. 15, $SE\frac{1}{4}$, $SE\frac{1}{4}$	10	4
80.	T. 1 S., R. 103 W., S. 23	3	1
81.	T. 2 N., R. 101 W., S. 31-34	400	162
32.	T. 2 N., R. 101 W., S. 11	4	2

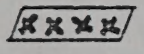
Total = 26,783 acres (10,843 ha)

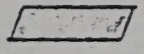
Mean = 327 acres (132 ha)

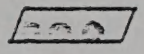
APPENDIX B

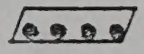
Soil Associations

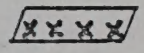
Map Legend

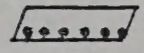
 #59: Camborthids - Torriorthents - Haplargids

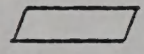
 #82: Fluvents

 #92: Chipeta - Persayo - Badland

 #93: Haplargids - Camborthids

 #96: Haplargids - Torriorthents - Rock Outcrop

 #99: Torriorthents - Rock Ourcrop

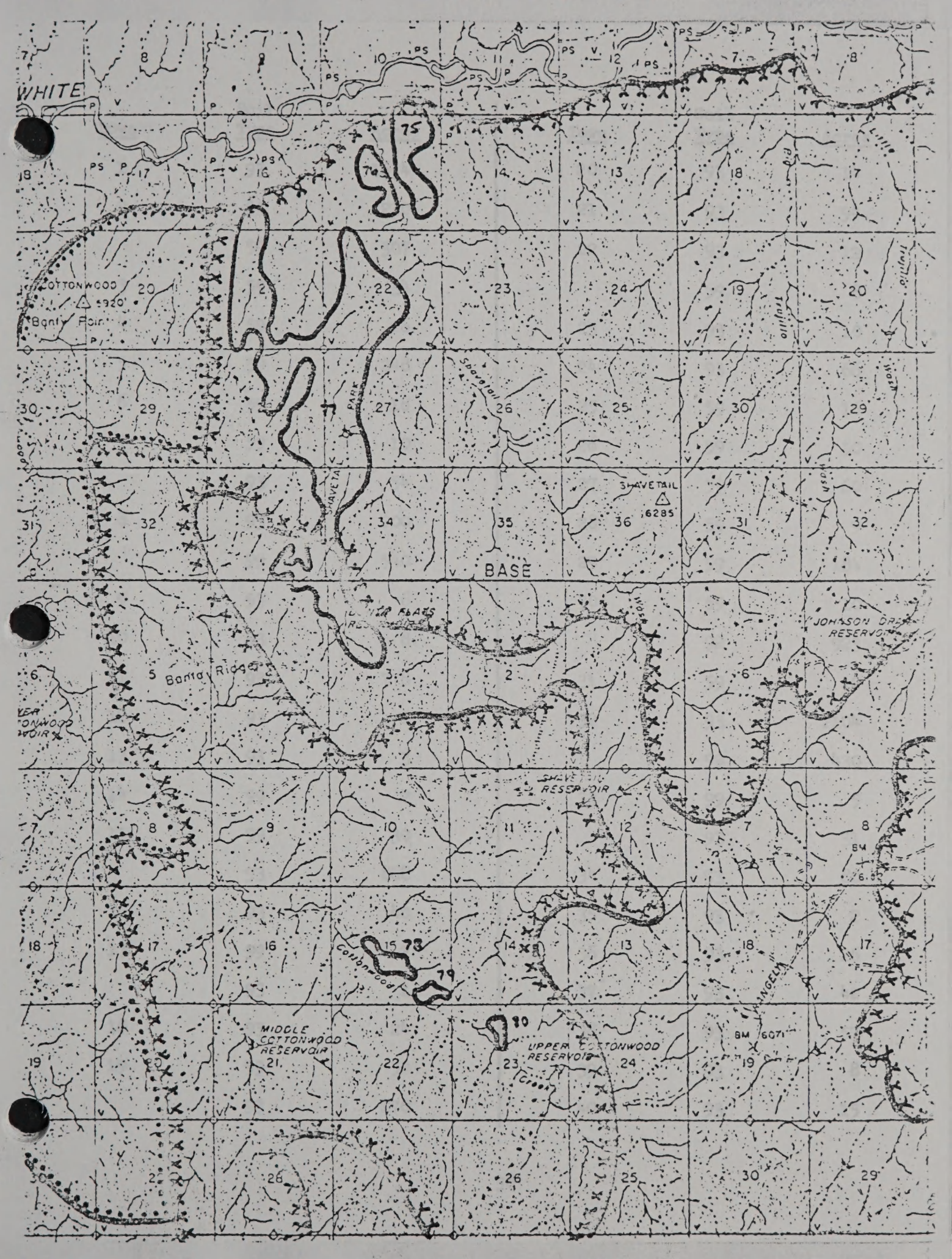
 #133:Ustorthents


DINOSAUR NATIONAL PARK
Dinosaur
DRIPPING RESERVOIR
Dripping
Twin Wash
Rock
Sand
Spencer
Mellen Hill
RAVEN
RANGELY
COUNTY
Raven
BM
NP

4N
3N
QUARRY
GRAVE
Willow
Blue Mountain
SKYLINE RESERVOIR
Martin Gap
RED WASH RESERVOIR NO. 1
MOFFAT
RIO BLANCO
Spooky Mountain
BM 6055'
ROCK SHALE RESERVOIR
Creek
BURNING WHITE RESERVOIR
Scullion
LINCOLN RESERVOIR
BM 5536'
Water
RANGLEY
6484
FOSSIL RESERVOIR
NATE SPRING RESERVOIR
BM 5750
Stinking
Draw
RAVEN BASIN RESERVOIR
Spring
DEAD DOG RESERVOIR
BM 5351'
Coal
Nate
Oil
Basin
Dog
Dead


Skull
Creek
Basin
1074A
WEIR
PLACE
SKULL
6838
Creek
RANCH
CEM.
Jones
55
56
57
54
Skull Creek
Elder
5763
BOX ELDER
SKULL CREEK
RESERVOIR
1072
BOX ELDER
COUNTY
COUNTY
Coal
COAL RIDGE
DAM
65
PRAIRIE DOG
RED WASH
RESERVOIR NO. 2
78
BOBCAT
RES.
CACTUS
RESERVOIR
RED WASH
RESERVOIR
NO. 3
KAVER
PEAK
DAM
65
Gulch
RIVER
1110

GRAVEL
RESERVOIR NO. 3
PETERSON DRAW RESERVOIR
Peterson
Wild Horse Spring
BAKING POWDER RESERVOIR
Middle
Fork
Wolf
Creek
Lost
Elk
Coal
Springs
Draw
WOLF CR. RES. No. 2
PWR
5816
LOWER RESERV
LOWER
DIVIDE CREEK DET. DAM
LOWER WOLF CR. RES. No. 3
Wolf Creek
DIVIDE CREEK RESERVOIR NO. 5
DIVIDE CREEK RES. No. 2
DIVIDE CREEK RES No. 3
DIVIDE CR. RES. No. 4
Coal Ridge
HALL DRAW RES.
RIVER
Stedman


WHITE
COTTONWOOD
5920'
Banty Flat
SHAVETAIL
6285
BASE
Banty Ridge
JOHNSON DRY RESERVOIR
MIDDLE COTTONWOOD RESERVOIR
UPPER COTTONWOOD RESERVOIR
Cottonwood
Creek
BM 6071
BM

Town	Soil Type	Acres
1	93	1634
2	93	210
	59	307
3	59	34
4	59	26
5	59	248
6	59	18
7	59	10
	93	54
8	93	200
	99	540
9	93	6
10	93	8
11	93	778
12	93	6
13	93	3
14	99	2
15	99	30
	93	868
16	93	40
17	99	2
	93	1
18	93	24
19	99	50
	93	170
20	93	14
21	93	94
22	93	12
	59	8
23	93	10
24	93	66
25	59	16
26	59	50
27	59	60
28	59	9
29	59	184
30	59	10
	92	923
31	59	12
32	93	2104
	99	430
33	99	5
	93	31
34	93	80
35	93	2
36	93	26
37	93	42
38	93	57
39	93	8
40	93	15

Town	Soil Type	Acres
41	93	24
42	93	60
43	93	18
44	93	102
45	93	45
46	93	12
47	93	196
48	93	321
49	93	80
	59	30
50	92	40
	59	538
51	59	16
52	93	2
53	93	8
54	93	36
55	93	230
56	93	1155
57	93	837
58	93	1508
59	93	7766
	59	510
60	93	226
61	93	15
62	93	9
63	59	10
	93	200
64	59	40
	93	32
65	82	90
	59	918
66	59	3
67	59	45
68	82	38
69	82	8
70	82	75
71	93	78
72	133	86
73	96	60
74	96	26
75	96	120
76	96	72
77	96	918
	133	190
78	96	36
79	96	10
80	96	3
81	59	50
	82	350
82	82	4

Soil Association #62

Fluvents Association

Warm, deep and moderately deep, well drained to somewhat poorly drained, often saline-alkaline, moderately fine to sandy soils, possibly affected by fluctuating water-tables on nearly level low terraces, first bottoms and flood plains.

About 95 percent of this association consists of deep and moderately deep, well drained to somewhat poorly drained, moderately fine to sandy soils. Medium and moderately fine textured soils will make up about 50 percent of these, the moderately coarse textured soils 30 percent and the sandy soils 15 percent.

Soil Association #59

Camborthids - Torriorthants - Haplargids Association:

Warm, very shallow to deep, calcareous, light colored, often gravelly to stony moderately coarse to moderately fine textured soils from shale and sandstone on sloping to steep colluvial slopes, hills, breaks and canyons.

About 45 percent of the association consist of very shallow to moderately deep, well drained, gravelly to stony medium textured, calcareous, light colored soils over shale and fine sandstone. About 30 percent of the association consists of moderately deep to deep, well drained, medium to fine, silty, textured soils with varying amounts of rock fragments. They also are calcareous, light colored and often slight to moderate saline-alkaline in reaction. Another 15 percent of the association consists of moderately deep to deep medium to moderately fine textured, calcareous, reddish-brown wind deposited soils on the flatter mesas and uplands on northerly slopes. The remaining 10 percent of the association consist of inclusions. These are made up of Rock outcrops, highly saline-alkaline areas, gravelly-cobbly coarse textured outwash deposits, and gullied land areas.

Soil Association #92

Chipeta - Persayo - Badland Association

Warm, dominantly very shallow to shallow, well drained, shaly moderately fine to fine textured, often saline-alkaline soils and moderately deep to deep, silty medium to fine textured, light colored, alluvial soils and severely eroded gullied lands on nearly level to moderately sloping uplands, terraces, and narrow bottoms.

About 85 percent of the association consists of very shallow and shallow, well drained, shaly moderately fine to fine saline-alkaline soils of the Chipeta and Persayo series. The Chipeta series will make up about 60 percent of the association with the Persayo series 25 percent. About 10 percent of the association consists of moderately deep to deep medium to fine textured, light colored soils that severely eroded into gullied land areas. The remaining 5 percent consists of inclusions. These are small areas of rock outcrop, deep, fine textured, highly saline-alkaline alluvial bottoms, and small areas of gravelly-cobbly outwash deposits on terrace breaks and fans.

Soil Association #93

Haplargids - Camborthids Association

Warm, deep to shallow, well drained, light colored, calcareous, and often gypsiferous, gravelly to stony medium textured soils, and reddish brown, medium textured wind deposited soils on nearly level to moderately steep slopes of low mountains, terraces and mesas.

About 60 percent of the associations consist of shallow to moderately deep, well drained, light colored, loamy textured soils that are often gravelly to stony and calcareous throughout. They also may contain varying amount of gypsum. About 30 percent of the association consists of moderately deep to deep, silty and loamy textured with scattered rock fragments. They also are calcareous and contain varying amounts of gypsum. The reamining 10 percent of the association consists of soil-inclusions. They are made up with small areas of deep, dark, loamy alluvial soils of narrow valley bottoms, moderately deep to deep, loamy to fine sandy loam textured calcareous, reddish-brown aeolian deposited soils on the flatter mesas and upland terraces, areas with high saline-alkaline reaction, and areas of shaly badlands or rock outcrops and cliffs as well as some eroded gullied land spots.

Soil Association #96

Haplargids - Torriorthents - Rock Outcrop Association

Warm, moderately deep to deep and shallow, well drained, often gravelly to stony, moderately coarse to moderately fine textured, often alkaline soils on gently sloping to moderately steep slopes of low hills, mesas, breaks and canyons and Rock outcrops.

About 40 percent of the association consists of shallow to deep, well drained medium and moderately fine textured, often gravelly and cobbly, calcareous, light colored, moderately developed soils. About 30 percent of the association are moderately deep and deep, well drained to somewhat excessively drained, moderately fine to moderately coarse textured, calcareous, soils often with thin dark surfaces, from shale and fine sandstone. Another 20 percent of the association consists of Rock outcrops of shale and sandstone. The remaining 10 percent of the association is made up of inclusions. There are areas of saline-alkaline soils, coarse gravelly-cobbly outwash deposits, and areas of moderately deep to deep, medium textured wind deposited soils, as well as small severely eroded-gullied areas.

Soil Association #99

Torriorthents - Rock Outcrop Association

Warm, dominantly very shallow and shallow, well drained, silty medium and moderately fine textured, light colored soils, and moderately deep to deep, calcareous, often saline-alkaline, medium and moderately fine textured soils on sloping to steep slopes on low hills, breaks, canyons, colluvial slopes and Rock outcrops.

About 80 percent of the association consist dominantly of very shallow to moderately deep with some deep, well drained to somewhat excessively drained, silty medium and moderately fine textured, gravelly or channery, calcareous, light colored soils. 15 percent of the association consists of Rock outcrop of steep cliffs and bluffs. The remaining 5 percent of the association consists of inclusions.

Soil Association #133

Ustorthents Association

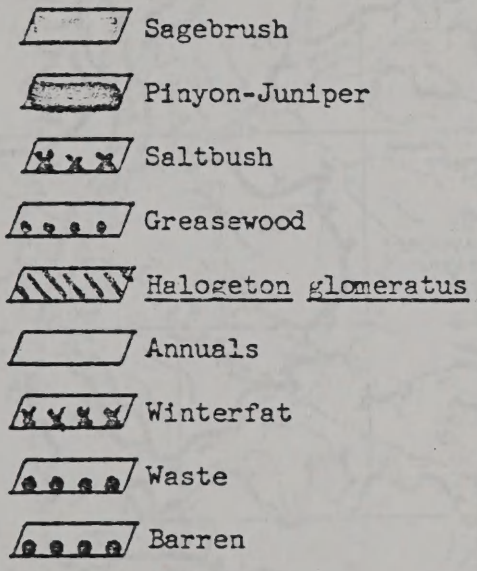
Cool, shallow to moderately deep, well drained, calcareous, moderately fine to moderately coarse textured and often stony soils with dark surface layers and light colored subsoils on moderately steep to steep mesas and shale or fine sandstone breaks.

About 90 percent of the association consists of shallow to deep well drained soil derived mainly from fine sandstone materials. They have thin dark surface layers, light colored subsoils, and are moderately fine to moderately coarse textured throughout with varying amounts of gravel and stone fragments. The remaining 10 percent of the association is comprised of inclusions. These consist of areas of rock outcrops, deep, sandy loam alluvial soils relatively free of stone fragments, small areas of moderately deep to deep reddish aeolian deposited soils. Also found is small areas of gullied lands or slicked off shale badlands.

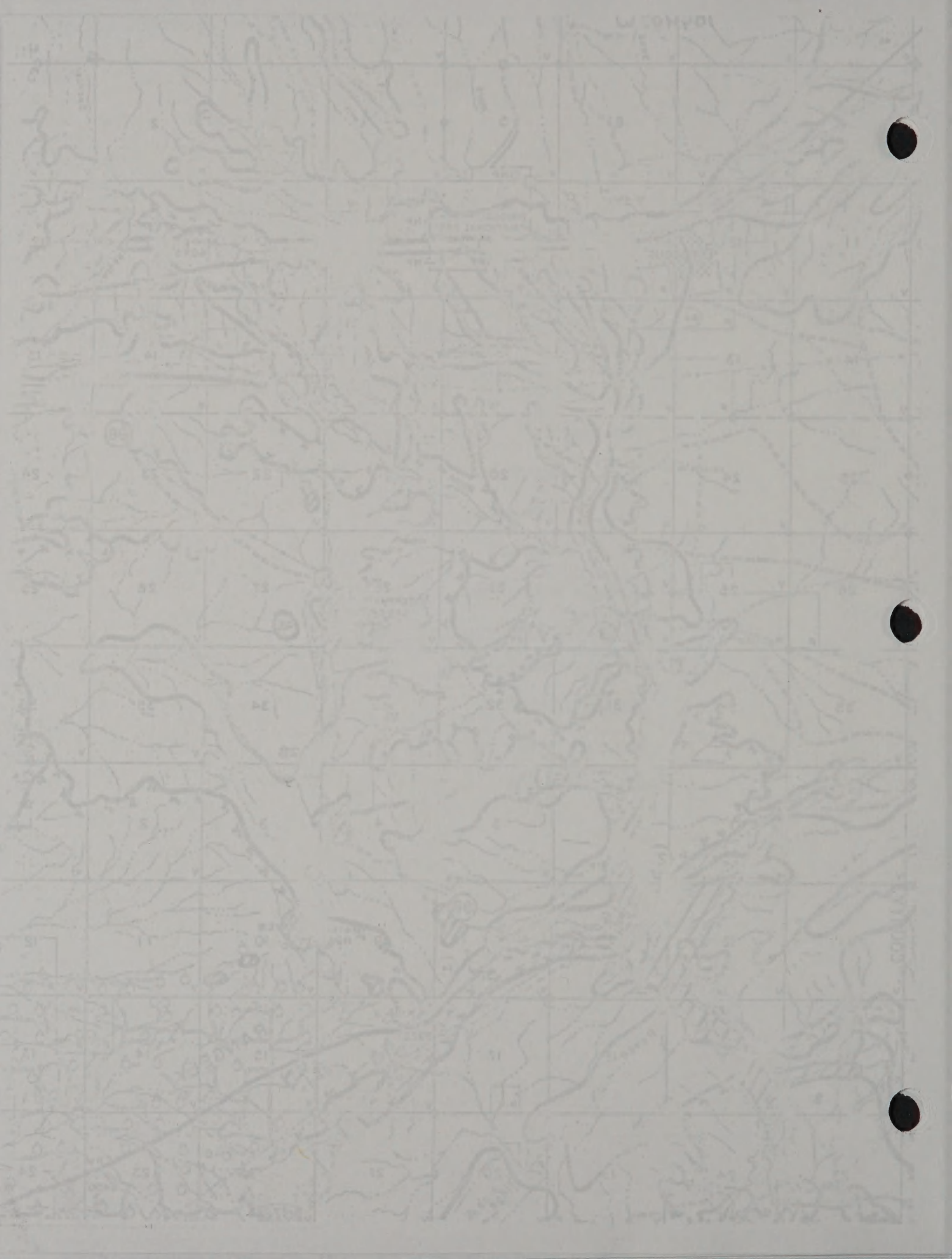
APPENDIX C

Vegetative Cover

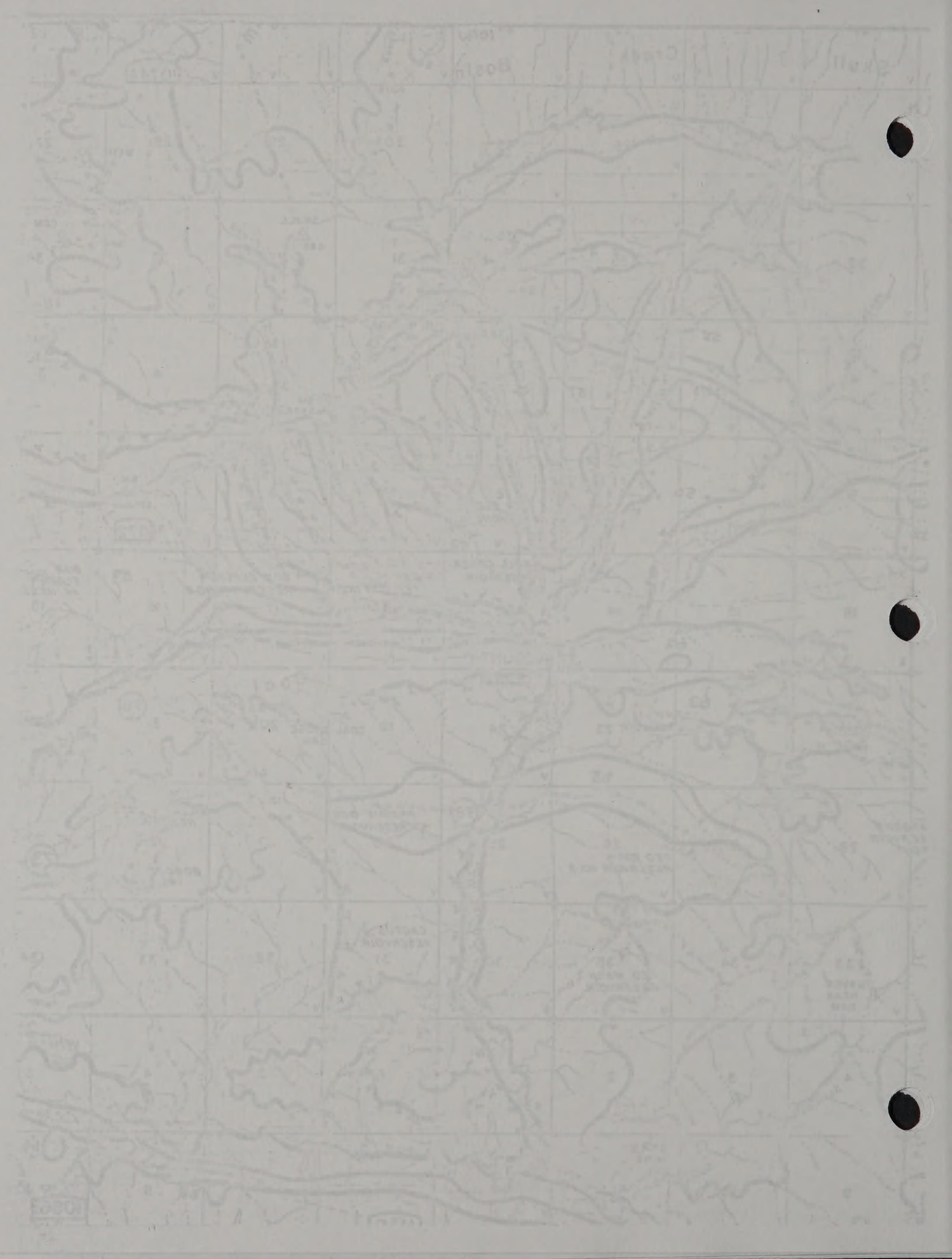
Map Legend




104°03'W
Sand
Rock
Twin
Spencer
ONP
DINOSAUR NATIONAL PARK
NP
Dinosaur
6045'
Spring
Willow
RANGELY
Raven
Ridge
COUNTY
5422
5450
6076

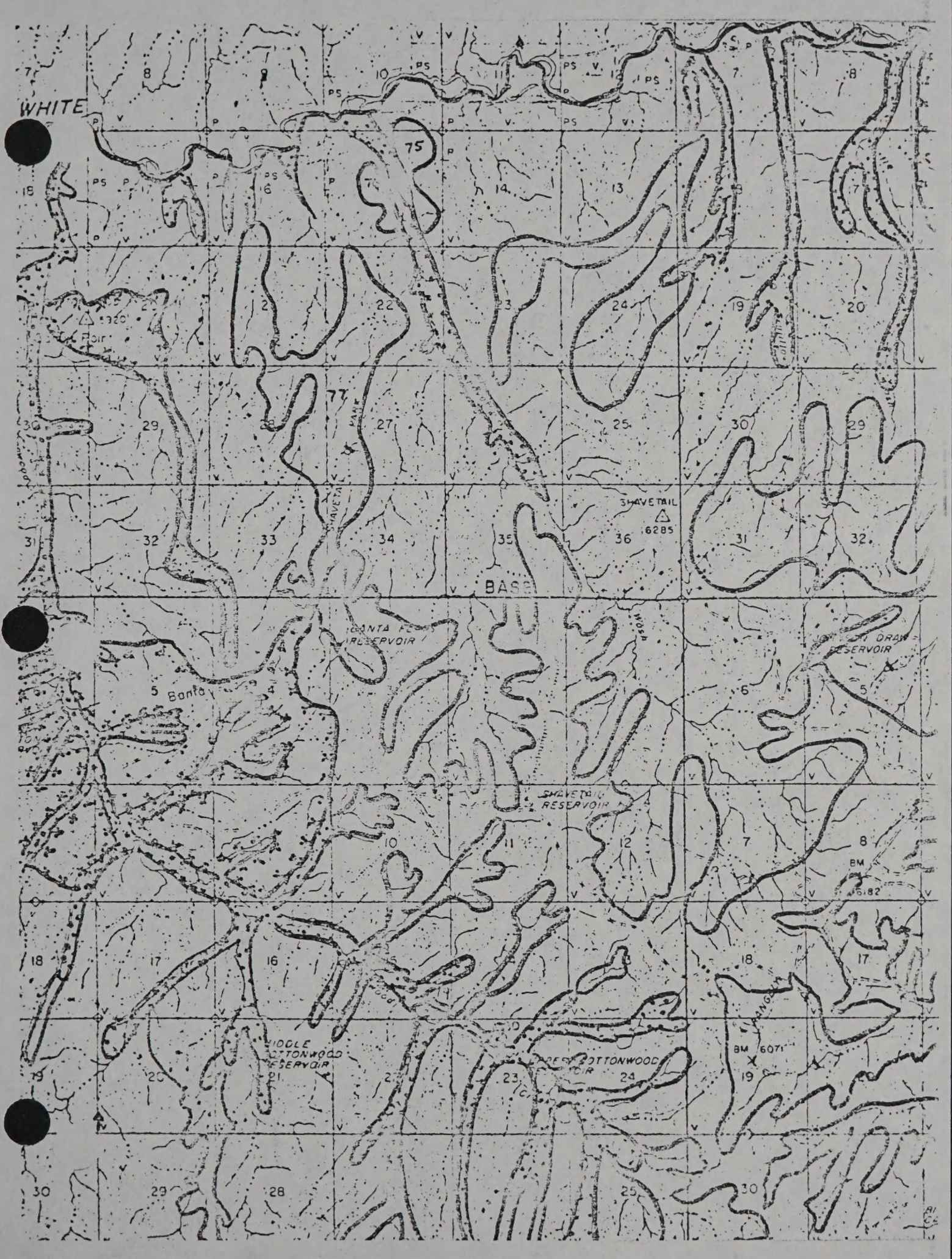



Skull Creek Basin
SKULL
SKULL CREEK RESERVOIR
BOX ELDER RESERVOIR NO. 2
COUNTY
COAL RIDGE DAM
PRAIRIE DOG RESERVOIR
RED WASH RESERVOIR NO. 2
CACTUS RESERVOIR
KAVER PEAK DAM
WHITE
074A
072
1056




SKYLINE RESERVOIR NO. 2
SKYLINE RESERVOIR
RED WASH RESERVOIR NO. 1
ROCK SHALE RESERVOIR
BURNING MINE RESERVOIR
LINCOLN RESERVOIR
RANGLEY
6484
NATE SPRING RESERVOIR
RAVEN BASIN RESERVOIR
DEAD DOG RESERVOIR
Blue
Willow
Spooky
Scullion
Dog
Coal
Basin
BM
6055'
5351'
QUARRY
RIO BLANCO
MOFFAT


GRAVEL
MANCOS RESERVOIR NO. 3
PETERSON DRAW RESERVOIR
PETERSON DRAW RES. NO. 2
Wild Horse Spring
Ridge
East Fork
BAKING POWDER RESERVOIR
MANCOS RESERVOIR NO. 4
Middle Fork
Wolf Creek
West Fork
WOLF CR. RES. No. 2
PWR
LOWER WOLF CR. RES. No. 3
DIVIDE CREEK DEF. DAM
DIVIDE CREEK RESERVOIR NO. 1
DIVIDE CREEK RES. No. 2
DIVIDE CREEK RES. No. 3
Cool Ridge
RIVER
Sledman


WHITE
SHAVETAIL
6285
SHAVETAIL RESERVOIR
BM
6071
BM
6182
RESERVOIR
RESERVOIR
RESERVOIR
RESERVOIR

Town	Vegetative Type	Acres
1	14	80
	9	130
	4	1424
2	4	140
	13	377
3	4	12
	14	13
	13	9
4	Hal.	8
	13	18
5	Hal.	90
	13	10
	14	148
6	Hal.	4
	14	6
	13	8
7	Hal.	15
	9	5
	13	44
8	4	50
	Hal.	50
	13	640
9	Ann.	2
	4	4
10	Ann.	8
11	4	70
	Ann.	120
	13	588
12	4	1
	13	5
13	4	3
14	13	2
15	14	6
	4	250
	13	642
16	4	3
	14	37
17	14	3
18	4	10
	14	14
19	14	25
	4	195
20	4	14
21	13	40
	4	54
22	13	20
23	13	2
	4	8
24	4	10
	9	56

Town	Vegetative Type	Acres
25	4	16
26	Hal.	5
	4	35
	13	10
27	13	2
	Hal.	5
	4	53
28	9	9
29	4	10
	Hal.	10
	13	164
30	13	933
31	4	12
32	13	710
	14	30
	4	1794
33	13	7
	14	29
34	13	20
	14	60
35	14	2
36	14	26
37	9	6
	14	36
38	14	57

Town	Vegetative Type	Acres
39	9	2
	14	6
40	4	15
41	4	24
42	4	60
43	4	6
	13	12
44	13	10
	4	92
45	14	8
	4	37
46	4	12
47	4	196
48	4	321
49	4	110
50	14	10
	9	80
	13	488
51	4	16
52	14	2
53	14	8
54	13	14
	14	22
55	13	230
56	14	190

Town	Vegetative Type	Acres
	13	965
57	14	110
	13	727
58	14	270
	13	1238
59	9	14
	Hal.	60
	14	170
	4	620
	13	7412
60	13	226
61	14	15
62	13	9
63	4	50
	13	160
64	4	25
	13	47
65	14	25
	13	370
	4	613
66	4	2
	13	1
67	9	10
	4	35
68	Ann.	2
	4	36
69	4	8
70	Ann.	15
	4	60
71	13	78
72	14	20
	9	10
	13	56
73	13	60
74	13	26
75	14	5
	4	115
76	14	5
	4	67
77	14	2
	9	140
	4	966
78	9	12
	14	24
79	9	5
	14	5
80	9	1
	14	2
81	4	400
82	4	4

Type 4 - Sagebrush

Mixed low growing to high growing shrubs dominated by Artemisia spp. with variable understory grass-forb composition and density. Type overstory varies from open to completely closed stands. The sagebrush type occurs at nearly all elevations on well drained deep soils.

Dominants:

Big sagebrush; Artemisia tridentata var. Tridentata, Artemisia, var. Wyominensus, black sagebrush; Artemisia nova, Utah serviceberry; Amelanchier utahensis, rabbitbrush; Chrysothamnus spp., bitterbrush; Purshia tridentata.

Associated Species:

Western wheatgrass; Agropyron smithii, Indian ricegrass; Oryzopsis hymenoides, needle and thread; Stipa comata, Junegrass; Kocleria cristata, cheatgrass; Bromus techtorum, broom snakeweed; Gutierrezia sarothrae, lupine; Lupinus spp., buckwheat; Eriogonum spp.

Type 9 - Pinyon-Juniper

Open to closed overstory of woodland conifers having highly variable understory shrub and grass-forb production. The pinyon-juniper vegetation type exists on a wide range of elevations and exposures, limited primarily by either semi-arid or humid-cool climatic conditions and saline-alkaline soils. Understory species composition and plant density is strongly related to overstory density and soil depths.

Dominants:

Utah juniper; Juniperus utahensis, pinyon; Pinus edulis

Associated Species:

Big sagebrush; Artemisia tridentata, Utah serviceberry; Amelanchier utahensis, rabbitbrush; Chrysothamnus spp., mountain mahogany; Cercocarpus montanus, bitterbrush; Purshia tridentata, western wheatgrass; Agropyron smithii, Indian ricegrass; Oryzopsis hymenoides, beardless bluebunch; Agropyron inerme, broom snakeweed; Gutierrezia sarothrae.

Type 13 - Saltbush

Mixed stands of low growing shrubs dominated by Atriplex spp. and low growing Artemisia spp. Understory vegetation exhibits considerable variation within the type, depending upon range condition. Principal understory vegetation in stands of fair range condition consists of perennial grasses and forbs. Stands in poor range condition have a high percentage of annual grasses and forbs of low density in the understory composition. The type is primarily found on lower elevation, deep alkaline-saline soils of semi-arid basins and lower foothill slopes.

Dominants:

Nutall saltbush; Atriplex nuttallii, shadscale; Atriplex confertifolia, fourwing saltbush; Atriplex canescens, blacksage; Artemisia nova, big sagebrush; Artemisia tridentata, spineless horsebrush; Tetradymia canescans, spiny hopsage; grayia spinosa.

Associated Species:

Indian ricegrass; Oryzopsis, western wheatgrass, Agropyron smithii, saline wild rye; Elymus salinus; cheatgrass; Bromus tectorum, halogeton; Halogeton glomeratus, broom snakeweed; Gutierrezia sarothrae, death camas; Zigadenus spp., greasewood; Sarcobatus vermiculatus.

Type 14 - Greasewood

Primarily dense stands of medium height (2-5') shrubs dominated by Sarcobatus vermiculatus. Understory growth in dense stands is usually very sparce, consisting primarily of low growing annual grasses and forbs. Open stands, where found, consist of a mixture of perennial shrubs with a perennial grass-forb understory. Type is primarily limited to saline-alkaline soils in drainage bottoms and alluvial deposits.

Dominants:

The primary dominant is greasewood; Sercobatus vermiculatus. Other shrub species appearing in more open stands are: rabbitbrush; Chrysothamnus spp., fourwing saltbush; Atriplex canescens, Nuttal saltbush; Atriplex nuttallii, big sagebrush; Artemisia tridentata.

R.101 W.
R.100 W.
R.99 W.
PARALLEL
Jack Springs Pass
Lone Mountain
Stoner Spring
Skull Creek
Skull Creek Basin
Skull Creek Rim
Massadona
Martin Gap
HORSE DRAW WELL
Three Springs Draw
Peterson Draw
PETERSON DRAW RESVR
PETERSON DRAW RESVR NO. 2
MANCOS RESVR NO. 1
MANCOS RESVR NO. 2
Wild Horse Spring
Baking Powder Ridge
T. 4 N.
T. 3 N.
T. 2 N.
T. 1 N.
WOLF CREEK RESVR
LOWER WOLF RESVR
LOWER WOLF CREEK RESVR
BOX ELDER RESVR
DIVIDE CREEK DET. DAM
DIVIDE CREEK RESVR. NO. 5
DIVIDE CREEK RESVR NO. 2
RED WASH RESVR NO. 1
RED WASH RESVR NO. 2
RED WASH RESVR NO. 3
DARWIN RESVR
PRAIRIE DOG RESVR
COAL RIDGE DAM
Coal Ridge
WILLARD FLATS RESVR
BOBCAT RESVR
CACTUS RESVR
Hall Draw
LINCOLN RESVR
FOSSIL RESVR
STALEY MINE
White River
Alkali Gulch
Hammond Draw
Quinn Draw
West Draw
Fletcher
Yanks Gulch
Spring Creek
CHASE DRAW RESVR
Chase Rim
Gillam Draw
DOUGLAS WELLS
RADIO TOWER
DOUGLAS
Hill Canyon
Rocky Ford
WEST MERIDIAN
Big Canyon
Cow Gulch
BASE
BASIN RESVR
Fliedge Draw
The Shoulder
Coal Draw
Twist
Red Gulch
Indian Springs
Oil
GREASEWOOD
CATHEDRAL
BEARD
Calamity Ridge
North Fork
Middle Fork
East Fork
Monument
Spring Gulch
Burnt Gulch
Oil Bonsa
Trail
Carls
Buckhorn
Little